

Claims:

1. A movable platform, comprising:

a frame for supporting a surface measurement system thereon;

at least four supports coupled to said frame and contacting a surface wherein said frame is supported above said surface;

a first three of said at least four supports being arranged in a linear alignment that defines a direction of travel for said frame, and a remainder of said at least four supports being spaced apart from said linear alignment;

said first three defined by a front support, a rear support and a center support centered between said front support and said rear support;

said center support being a floating support capable of substantially vertical movement;

at least two of said front support, said rear support and said center support being wheels configured to roll in said direction of travel; and

means coupled to said wheels for synchronizing rolling movement thereof on said surface.

2. A movable platform as in claim 1 wherein all of said at least four supports are wheels.

1 3. A movable platform as in claim 1 wherein two of said front
2 support, said rear support and said center support are wheels,
3 and wherein a remaining one of said front support, said rear
4 support and said center support is a support that slides on
5 said surface.

1 4. A movable platform as in claim 1 wherein each of said
2 wheels is rigid and has a solid rubber tire mounted on the
3 circumference thereof.

1 5. A movable platform as in claim 1 further comprising means
2 for indicating relative positions of each of said wheels.

1 6. A movable platform as in claim 1 further comprising means
2 coupled to said center support for measuring said
3 substantially vertical movement thereof.

1 7. A movable platform as in claim 1 further comprising an
2 odometer coupled to one of said wheels.

43

1 8. A movable platform as in claim 1 wherein said means for
2 synchronizing comprises:

3 a gear wheel coupled to each of said wheels for
4 corresponding rotation therewith; and

5 an endless loop coupled to each said gear wheel wherein
6 rotation of each said gear wheel causes corresponding movement
7 of said endless loop.

9. A movable platform, comprising:

a frame;

at least four supports coupled to said frame and contacting a surface wherein said frame is supported above said surface;

a first three of said at least four supports being arranged in a linear alignment that defines a direction of travel for said frame, and a remainder of said at least four supports being spaced apart from said linear alignment;

said first three defined by a front support, a rear support and a center support centered between said front support and said rear support;

said center support being a floating support capable of substantially vertical movement;

a sensor coupled to said center support for measuring a vertical component of said substantially vertical movement and for generating a signal indicative thereof;

at least two of said front support, said rear support and said center support being wheels configured to roll in said direction of travel;

an odometer coupled to one of said wheels for measuring a distance traveled on said surface caused by each rotation of said one of said wheels and for generating a signal indicative of said distance traveled; and

25 means coupled to said wheels for synchronizing rotation
26 thereof wherein said distance traveled by said one of said
27 wheels is the same for remaining ones of said wheels.

1 10. A movable platform as in claim 9 wherein all of said at
2 least four supports are wheels.

1 11. A movable platform as in claim 9 wherein two of said
2 front support, said rear support and said center support are
3 wheels, and wherein a remaining one of said front support,
4 said rear support and said center support is a support that
5 slides on said surface.

1 12. A movable platform as in claim 9 wherein each of said
2 wheels is rigid and has a solid rubber tire mounted on the
3 circumference thereof.

1 13. A movable platform as in claim 9 further comprising means
2 for indicating relative positions of each of said wheels.

1 14. A movable platform as in claim 9 wherein said means for
2 synchronizing comprises:
3 a gear wheel coupled to each of said wheels for
4 corresponding rotation therewith; and
5 an endless loop coupled to each said gear wheel wherein
6 rotation of each said gear wheel causes corresponding movement
7 of said endless loop.

15. A movable platform for rolling movement on a hard surface having a contoured profile, comprising:

a frame;

at least four supports coupled to said frame and contacting said surface wherein said frame is supported above said surface;

a first three of said at least four supports being arranged in a linear alignment that defines a direction of travel for said frame, and a remainder of said at least four supports being spaced apart from said linear alignment;

said first three defined by a front support, a rear support and a center support centered between said front support and said rear support;

said center support being a floating support capable of substantially vertical movement;

a sensor coupled to said center support for measuring a vertical component of said substantially vertical movement and for generating a signal indicative thereof;

at least two of said front support, said rear support and said center support being wheels configured to roll in said direction of travel;

an odometer coupled to one of said wheels for measuring a distance traveled on said surface caused by each rotation of said one of said wheels and for generating a signal indicative of said distance traveled;

26 means coupled to said wheels for synchronizing rotation
27 thereof when rolling on said surface wherein said distance
28 traveled by said one of said wheels is the same for remaining
29 ones of said wheels; and

30 a processor mounted on said frame and coupled to said
31 sensor and said odometer for determining the contoured profile
32 of said surface along said direction of travel using said
33 vertical component of said substantially vertical movement and
34 said distance traveled.

1 16. A movable platform as in claim 15 wherein all of said at
2 least four supports are wheels.

1 17. A movable platform as in claim 15 wherein two of said
2 front support, said rear support and said center support are
3 wheels, and wherein a remaining one of said front support,
4 said rear support and said center support is a support that
5 slides on said surface.

1 18. A movable platform as in claim 15 wherein each of said
2 wheels is rigid and has a solid rubber tire mounted on the
3 circumference thereof.

1 19. A movable platform as in claim 15 further comprising
2 means for indicating relative positions of each of said
3 wheels.

1 20. A movable platform as in claim 15 wherein said means for
2 synchronizing comprises:
3 a gear wheel coupled to each of said wheels for
4 corresponding rotation therewith; and
5 an endless loop coupled to each said gear wheel wherein
6 rotation of each said gear wheel causes corresponding movement
7 of said endless loop.